U.S. Department of Energy
Office of Civilian Radioactive Waste Management

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Transportation Infrastructure Acquisition

Presented to:
NSNFP

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Introduction

- **The Office of National Transportation (ONT) has made steady progress in establishing the groundwork for the acquisition of the transportation infrastructure.**
- **Today, I will provide address:**
  - **Requirements for cask systems**
  - **Cask integration efforts to ensure interface with the Yucca Mountain repository and utility sites**
  - **Determining capabilities of commercially available casks**
  - **Schedule for rolling stock acquisition**

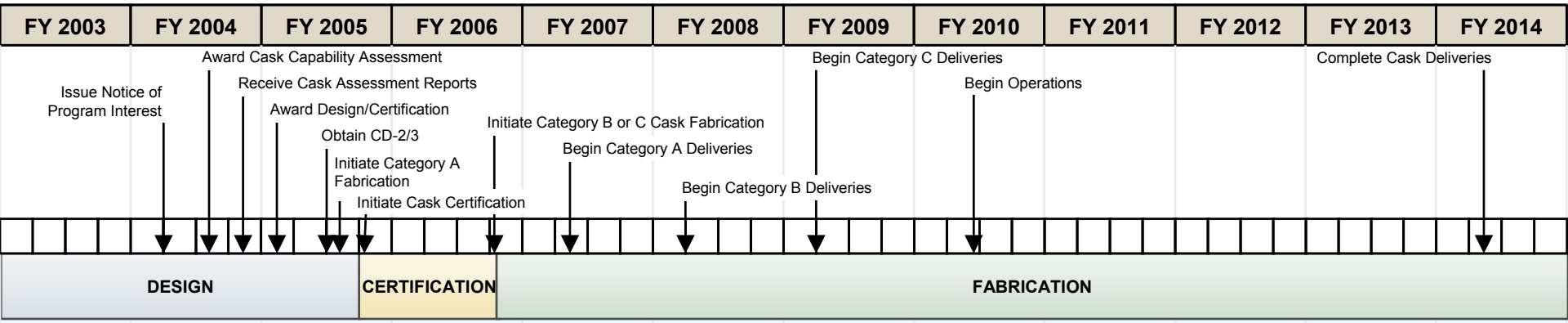
Cask System Requirements

- The Department of Energy (DOE) has a preference for purchasing existing, certified cask systems.
- DOE has a bias toward cask systems that keep radiation exposure to workers and the public as low as reasonably achievable (ALARA) via design or procedure.
- DOE has a preference for cask systems that provide the maximum flexibility in terms of facility and fuel compatibility.
- ONT is planning to convene a meeting to bring the Office of Repository Development (ORD) and cask vendors together to discuss repository and transportation cask interfaces.

Cask Integration with the Repository

- **The Yucca Mountain repository will operate under 10 CFR Part 63 license issued by the Nuclear Regulatory Commission (NRC).**
- **10 CFR Part 71 will govern the transportation casks.**
- **Coordination efforts are underway to utilize transportation casks that will be compatible with the Yucca Mountain repository.**
  - **Use of compatible cask systems will facilitate waste receipt.**

Cask Acquisition Project Overview



- Functional Requirements: DOE will refine based on vendor input provided in Cask Capability Assessments
- Designs (preliminary and final): Vendors will generate designs for Category B & C casks (i.e., existing designs w/ modifications and new designs) at a sufficient detail level for NRC certification

- Vendors will submit licensing applications to the NRC for certification
- Fabrication may not be initiated until vendors obtain NRC certifications

- Fabrication and Delivery: Vendors will fabricate and deliver fully certified casks to DOE, based on negotiated schedules

Cask Capability Reports

- **Purchase orders to perform cask capability assessments were placed with vendors possessing NRC Certificates of Compliance (CoC).**
  - **All reports were received by August 28.**
- **Vendors are now familiar with DOE's spent nuclear fuel (SNF) and high-level radioactive waste (HLW) data.**
- **Vendor meetings held in late August and early September provided an opportunity to discuss the data and the vendors' ability to meet ONT's needs.**
  - **Vendors explained the analysis and/or modifications necessary to accommodate the maximum amount of the SNF and HLW inventory.**

Casks with Existing Certificates

Cask Models Having a Current Transport Certificates of Compliance		Storage-Only Cask Models which may receive One-Time-Use Certification	
MODEL	**C of C No.**	**MODEL**	**C of C No.**
NAC-LWT	**9225**	TN-BRP	9202
GA-4	**9226**	TN-REG	9206
GE-2000	9228	**TN-40**	**72-0010**[1]
NAC-STC	**9235**	**CASTOR V-21**	**72-1000**
MP-187	**9255**	Westinghouse MC-10	72-1001
HI-STAR-100	**9261**	CASTOR X-33	72-1018
NAC-UMS	**9270**	NAC-128S/T	72-1020
TS-125	9276	**TN-32**	**72-1021**
TN-FSV	9277		
TN-68	**9293**		
MP-197	**9302**		

(Bold indicates casks evaluated.)

Current Cask Size Envelope

- **All new casks purchased will fall within this envelope:**

Cask Characteristics	Minimum	Maximum
Length of cask body w/o impact limiters	72 inches	250 inches
Diameter of main cask body	38 inches	108 inches
Diameter of cask across upper trunnions	40 inches	120 inches
Diameter of cask closure lid	13 inches	88 inches
Diameter of impact limiters	65 inches	156 inches
Maximum loaded weight	24,000 lbs.	360,000 lbs.

Cask Radiological Capabilities

- **Current transportation cask capabilities are enveloped by the following characteristics:**
  - **Maximum assembly burnup: 45 gigawatt-days/metric ton of uranium (MTU)**
    - **Fuel must be intact and cannot be in canisters.**
  - **Minimum assembly enrichment: 1.5%**
  - **Maximum assembly enrichment: 5.0%**
  - **Maximum uranium loading per assembly: 0.480 MTU**
  - **Minimum cooling time: 5 years**

Facility Interface Data Sheets Summary

- **Seventy-four reactor facilities have provided responses to the Facility Interface Data Sheets (FIDS) sent out in March 2004.**
- **FIDS responses point out a number of facility infrastructure limits that will affect cask selection and transportation planning, including:**
  - **Minimum crane capacity: 25 tons**
  - **Minimum floor loading capacity: 25 tons**
  - **Limiting facility portal dimension: 60 inches**

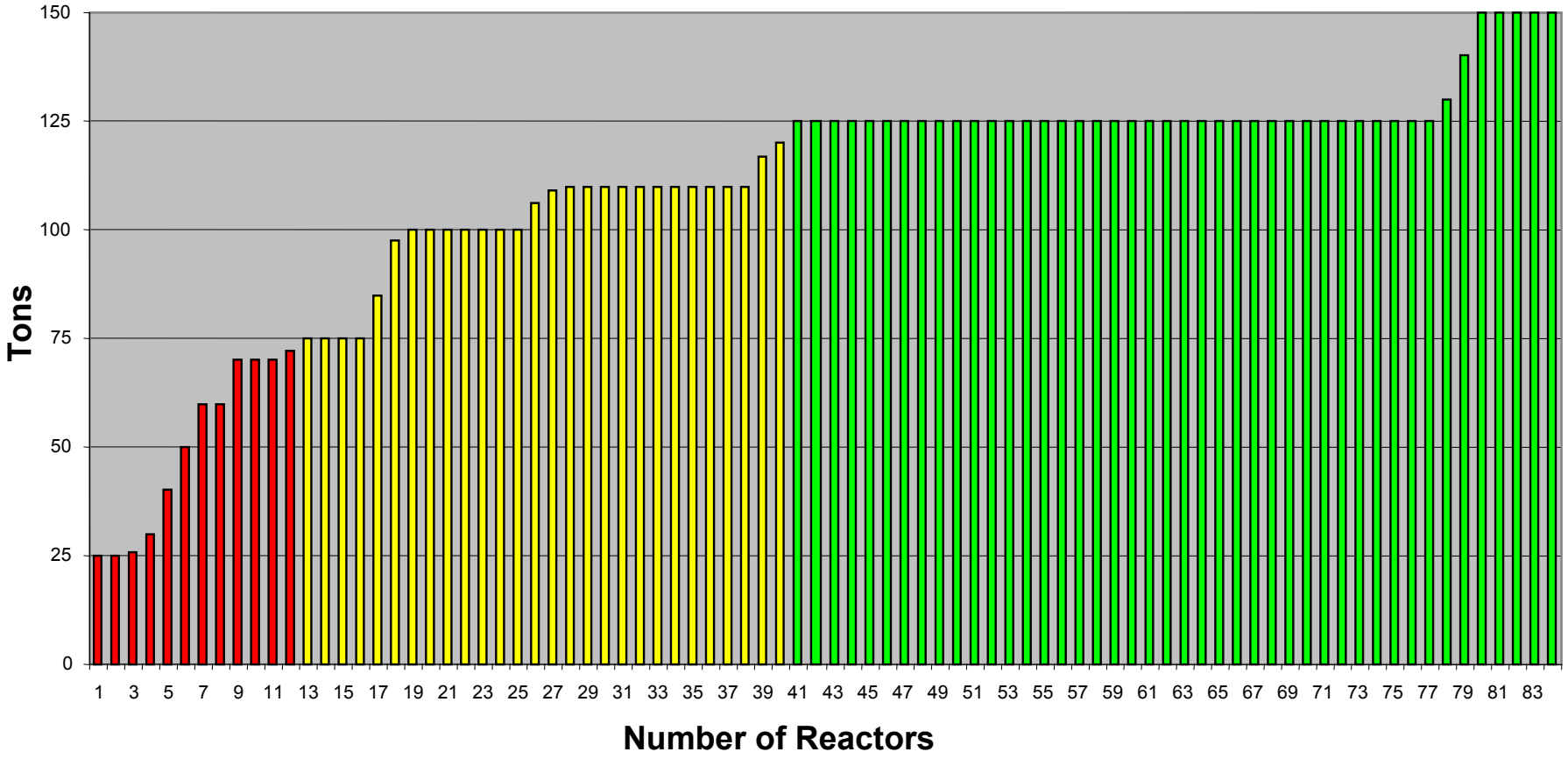
Facility Interface Data Sheets Summary (continued)

- About 40 reactor sites are currently anticipated to have a crane capacity of 120 tons or less.
- Crane lifting capacity will be a primary factor in determining the type of shipping cask a facility can load.

Interface with the Utilities

- **Existing facilities will be used at the utilities.**
- **By 2010, over 75 nuclear reactors will have committed to dry storage.**
  - **Sites have ability to handle large casks.**
- **Utilities routinely transport large, heavy loads during normal operations and maintenance activities.**
- **Heavy haul and barges may be used for short distances to reach a railroad siding.**

Utility Reactor Crane Capacities



Conclusions Regarding Commercial SNF

- **The cask capability reports confirmed DOE's original estimate that about 40% of commercial SNF could be shipped in casks under current certificates.**
- **Preliminary analysis indicated that CoCs could be modified to accommodate more than 90% of the commercial SNF inventory projected for 2010 and 2015.**
- **As a result, few new cask designs or "Category C" casks will be needed for commercial SNF before ~2020.**
  - **No new large casks will be developed.**
  - **Some smaller casks may need to be developed to address utility infrastructure limits.**

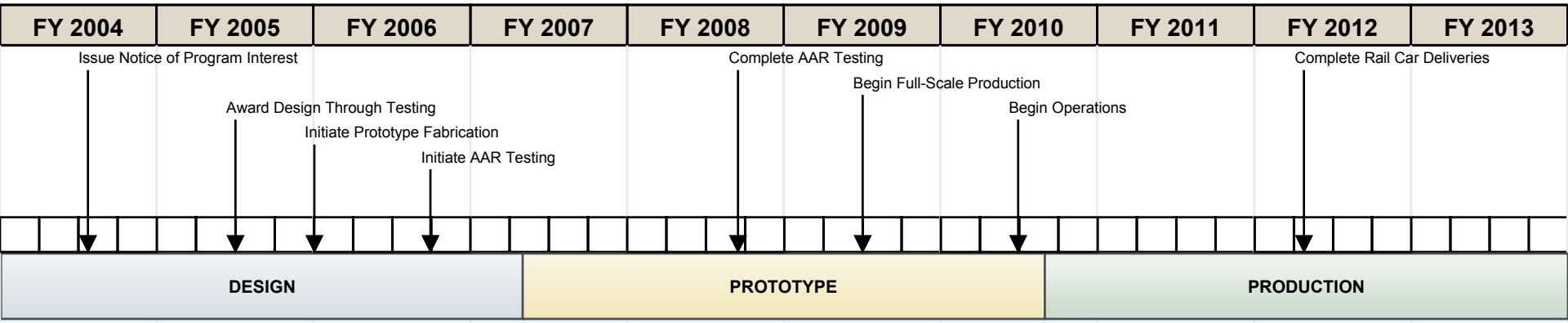
DOE SNF and HLW Conclusions

- **The quality of DOE HLW and SNF data and information was deemed sufficient to obtain a CoC.**
  - **However, because representative rather than bounding data was used for DOE-SNF, the allowable contents stipulated in the CoC may be too narrowly defined.**
  - **Consequently, there is concern about the ability to load a cask with DOE-SNF.**
    - **The material's owner must certify that the material meets the limits of a CoC's "allowable contents."**
- **The only fuel shipped during the first five years will be in canisters.**

DOE SNF and HLW Conclusions (continued)

- **Casks exist today that can ship DOE wastes that have been placed in canisters.**
  - **Generally, the thermal, structural, and shielding requirements for commercial SNF bound those of the DOE material.**
- **New internal basket designs would be developed to accommodate the DOE canisters.**
  - **Certificate modifications will be required for the new baskets.**
- **During the first 5 years of shipping operations, no new (Category C) casks will need to be developed for DOE material.**

Rolling Stock Acquisition Overview



- Functional Requirements: Determine requirements sufficient for competition and detailed design of vehicles
- Design and Analysis: Complete design and analysis to Standard requirements
- Preliminary design review (PDR): Submit PDR to Association of American Railroads (AAR) Equipment Engineering Committee, revise the design/submittal as necessary per AAR advice

- Prototype: Build a prototype car
- Test the prototype at Transportation Technology Center, Inc and redesign as needed to pass the test
- Demonstration: Submit operators log for a demonstration run over representative route
- Conditional Approval: Submit the test reports to the AAR and revise reports as requested

- Production Design: Develop detailed shop drawings, tooling and set up
- Production and Delivery: Manufacturing, delivery, acceptance, product support
- Full Approval: After 100,000 service miles submit follow-up test report to Equipment Engineering Committee

Summary

- **ONT has many challenges ahead in procuring the transportation infrastructure to support repository operations.**
- **Many drivers will influence the development of the transportation infrastructure.**
- **ONT is emphasizing flexibility in its procurement approach in order to adapt to external influences and changing requirements.**